USING COMPUTERS AS CREATIVE TOOLS

The debate about technology's place in classrooms might vanish if the machines are used to expand students' self-expression.

I recently attended Apple Computer CEO Steve Job's keynote address at the annual Macworld Conference in San Francisco. Amidst the demonstrations of OS X, the launch of the sexy new Titanium Powerbook and the obligatory race between a Pentium IV and Macintosh G4 (you can guess which won), Jobs said some things that I believe will be critically important to the future of computing. Quotations from the CEOs of Gateway and Compaq decrying the death of the personal computer were rebuffed by Jobs who not only asserted that the PC is not dead, but that we are entering a new age of enlightenment. Jobs declared that the personal computer is now "the digital hub for the digital lifestyle."

While everyone is excited about new handheld organizers, video cameras, cell phones and MP3 players, these devices not only require a personal computer for installing software, backing up files and downloading media—they are made more powerful by the PC. The personal computer is the only electronic device (at least for the foreseeable future) capable of multimedia playback, super-computer-speed calculations and massive data storage. Most importantly, the personal computer is required for those who wish to create, rather than be passive recipients of bits generated by others.

> **Computers have transformed nearly every aspect of society; yet schools remain relatively untouched.**

Jobs discussed how video cameras are cool, but iMovie makes them much more powerful. Boxes full of videotapes are no longer lost in the attic, because users can easily produce edited movies shareable with friends, relatives and the world. Jobs then launched iDVD, Apple's stunning new technical breakthrough that allows anyone to create their own DVDs in minutes. Think about what this could mean in a classroom! Class plays, science experiments and sporting events could be shared with the community and playable with state-of-the-art quality on home televisions. Video case studies of best practice can be used in teacher education complete with digital quality audio/video. Zillions of digital photos and scanned images of student work can be assembled as portfolios stored on one disk and viewed anywhere.

A company representative from Alias Wavefront was brought to the stage to demonstrate its software package, Maya. Maya is the 3D graphics tool used by George Lucas to make the most recent *Star Wars* film. The quick demo showed how a flower paintbrush could be chosen, and with the wave of the mouse, flowers could be drawn in 3D on the computer screen. These were no ordinary flowers though. The software knew to make each flower slightly different from the others, as they would appear in nature. The software also knew how they would behave if wind were to be added to the scene. Clouds drawn knew to move behind the mountains. Until now, Maya required a specially configured graphics workstation. It now runs on a Macintosh G4. While the software is currently too expensive for most kindergarten classrooms, it occurred to me that the world will be a much cooler place when five year-olds can use Kid-Pix-level fluency to create with the same tools as George Lucas.

Jobs argued that iMovie makes video cameras more powerful and iDVD enhances the value of both the video camera and DVD player. Therefore, the personal computer not only powers digital devices, but empowers lives. This is a profoundly liberating and enabling vision for society.

As I left the auditorium I thought, "Steve Jobs really gets it." However, my admiration for his vision and desire for the new "toys" was quickly tempered by thoughts regarding the imagination gap guiding the use of computers in schools. Not once did Jobs compare the PC to the pencil or refer to it as a tool for getting work done. No standards for computer-use were offered. Instead, he challenged attendees to view the computer as a way of inspiring a renaissance of human potential.

JUST MAKE SOMETHING The personal computer is the most powerful, expressive and flexible instrument ever invented. It has transformed nearly every aspect of society, yet schools remain relatively untouched. Rather than be led by technological advances to rethink models of schooling, schools and the software industry have chosen to use computers to drill for multiple-choice tests, play games and find answers to questions available in reference books via the Internet. While the Internet is an incredibly powerful and handy reference tool, its real potential lies in its ability to democratize ➡

publishing and offer unprecedented opportunities for collaboration and communication. The dominant practice is to restrict or forbid this openness through filtering software, acceptable-use policies and overzealous network administrators. When the paradigm for Internet use is "looking stuff up" it should come as no surprise that kids are going to look at inappropriate content.

The results of this imagination paralysis are too numerous to mention. The hysteria about Internet use, growing disenchantment with schooling and calls to reduce tech funding are clearly the consequences of our inability to create more explicit, creative and public models of computers being used by children to learn in magnificent ways. The recent dubious report, Fool's Gold, by the Alliance for Childhood, takes aim at schools' computer use by illustrating the trivial and thoughtless ways computers are used in schools. A moment of candor requires us to admit that most of their criticisms are correct. Schools do use computers in dopey ways. However, that is not a legitimate argument for depriving kids of the opportunity to learn and express themselves with computers. It is however an indictment of the narrow ways in which schools use technology. Experts advocating the use of handheld devices as "the perfect K-12 computer" so students may take notes or have homework assignments beamed to them are cheating young people out of rich learning adventures.

It's as if schools have forgotten what computers do best. Computers are best at making things—all sorts of things. Educational philosophers including Dewey, Piaget, Papert, Vygotsky, and Gardner have been telling us forever that the best way to learn is through the act of making things, concrete and abstract. The PC is an unparalleled intellectual laboratory and vehicle for self-expression yet schools seem ill-equipped or disinclined to seize that potential.

Kids can now express their ideas through film-making, Web broadcasting, MIDI-based music composition and synchronous communication. They can construct powerful ideas (even those desired by the curriculum) through robotics, simulation design and computer programming.

While there is much rhetoric about kids making things with computers, those projects tend to reinforce old notions of teaching. Hyperstudio book reports or databases containing the pets owned by classmates are not what I have in mind. Kids should make authentic things borne of their curiosity, interests and reflecting the world in which they live.

I cannot imagine that the critics of public education and the investment in educational technology would object to kids using computers in such authentic, deeply intellectual and creative ways. Rather than creating unproductive standards for computer use, educational computing organizations should be building, documenting and sharing compelling models of how computers may be used to inspire joyful learning throughout the land.

We can do well by exercising a bit more creativity. We can neutralize our critics and move education forward if we shift our focus towards using school computers for the purpose of constructing knowledge through the explicit act of making things. Children engaged in thoughtful projects might impress citizens desperate for academic rigor. Emphasizing the use of computers to make things will make life easier for teachers, more exciting for learners and lead schools into this long-promised golden age. **CA**

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The Short Attention Span Guide to Media Streaming on the Cheap
© 2001 Gary S. Stager

1) Get some media
Film something, record something, create an animation, download an audio or video file, etc…

2) Digitize it
Use an analog to digital device to import video, a microphone for audio or a patch-cable from an external stereo. You can also copy a CD file to your hard drive or download a file from the web.

Save the data on the hard drive of your computer in a standard format, ie... .WAV or .AIFF for audio and .MOV or .AVI for video. Save in the highest quality format you can afford (in time and disk space). We are going to reduce the quality by compressing the file so this is clearly an example of "garbage in – incomprehensible garbage out."

Be sure to save with the proper extension. I know what you're thinking. "Isn't this the 21st century, do Windows users really still need file extensions?"

3) Compress the file and export it in either QuickTime or RealMedia format.
iMovie does a nice job of exporting movie files ready for http streaming on the web. It does so by default. If you use the Export-Expert mode for some reason, be sure that the checkbox for prepare for Internet streaming is checked. While you can have QuickTime movies without pictures, RealAudio is the more common way of streaming audio.

You can also use the terrific *Cleaner 5* software to compress and export Real or QuickTime files. The quality is terrific, you can batch process clips AND the software costs several hundred dollars.

Regardless of whether you use QuickTime or Real as your destination format you will need to determine the quality of the file you which to creare. Audio can be compressed like crazy. Video has greater aesthetic limitations. You probably wish to prepare your media for the most common slowest connections your audience will be using to access your masterpiece.

If you want to stream video or audio files in the RealMedia format you will need to download the free *Real Producer Basic* software from www.real.com. Boot the software, follow instructions and your nice small smooshed media files will be export with extensions .ra or .rm.

4) Put the files somewhere
If you export in QuickTime format, upload your file to a standard web server.

If you export in Real format, upload the compressed file to a standard web server.

5) What the heck is a metafile?
Here's the tricky part if you are publishing a RealVideo or RealAudio file. When your browser points to a file with an extension it doesn't recognize, it automatically tries to download it. We don't want to download the file. We want to play it with the RealPlayer plug-in and application. (Be sure you have downloaded and installed the RealPlayer Basic and QuickTime plug-ins and files on your computer)

The browser does not like .ra and .rm files so we have to trick it into welcoming their data onto the screen. We do this by creating a metafile, ending with the extension .ram.

A metafile is simply a file containing the link to the original media file and is saved with the extension .ram. When the browser hits the .ram file it goes and gets the file listed in the metafile and tries to play it.

6) Creating a metafile
For those of you already nodding off, don't worry. There's not too much farther to go.

You can create a metafile using a basic text editor or word processor. Notepad and SimpleText will do the job quite nicely. The metafile will only contain one line of text. That text is the path to the original media file you compressed.

In other words, the text looks something like this:
http://www.stager.org/workshopvideo.ra

Now save this file with the name *workshopvideo.ram*

You now need to upload the new metafile and the original media file into the same server directory (you don't have to be in the same directory, but it makes things easier for beginners).

7) Link to the media file
Put a link in a web page (you can make a web page, can't you?) to either the QuickTime file you uploaded to a web server or the Real metafile you uploaded.

8) Test the link
Point your browser to the web page, click on the link and see if your audio or video plays. If it doesn't, check the names of the links.

9) Tell the world about your web page and let them enjoy your new streaming media!

10) The End!

Create Pro Transitions in iMovie

by Andrew Tokuda

We love iMovie for its effects and transitions capability, but oh, how we hate watching bad ones in action! Effects overload is a trap that novice iMovie users tend to fall into when they discover that these "neat" effects are easy to use and can give their movies that "professional" look. Uh, no. Put down your DV camera and go watch some TV—actively. Look at the transitions in different programs and commercials. You'll notice that most are simple cuts, fades, and dissolves. No ripples, no clock-wipes, no spinning cubes (unless you're watching syndicated Home Improvement reruns).

ON THE DISC
MacAddict Transitions Examples
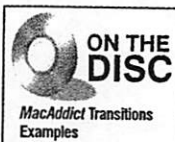
iMovie transitions can do more than just provide simple segues between scenes.

That said, any movie can benefit from special transitions and effects if you know when to use them. If you want to add true professionalism to your DV work, here's how to employ iMovie's transitions tastefully to create pro-caliber special effects.

Intensify Scenes with White Flash

EASY

WHAT YOU NEED
• iMovie 2
• iMovie Plug-in Pack 2.1.1 (requires Mac OS X; www.apple.com/imovie)
• *MacAddict* Transitions Examples (on the Disc)

White-flash effects are great for cutting between quick, intense scenes, and Hollywood action-movie trailers often use them to add an explosive quality. For our example movie, TrailerFinal.mov, we intercut video footage and title stills with white-flash effects. Watch TrailerCuts.mov to see this sequence without transitions (dreadful). Here's how we spiced it up using iMovie's Wash In transition, which fades in a clip from white (use your own or iMovie's sample clips, and follow along).
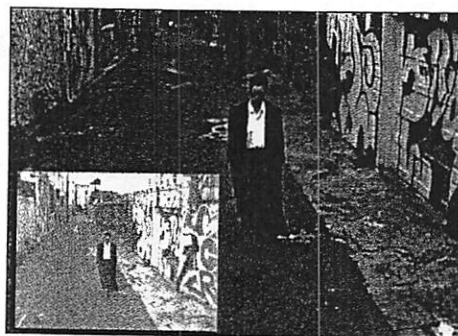
Bring energy to your movie trailers by adding a flash of white (inset) between quick cuts.

1 Add the Effect Drag two or more clips from the Clips window onto the timeline in the order you want them to appear. Click Transitions and select Wash In; a sample plays in the Preview window. Move the Speed slider until you see 00:20 (under 1 second) displayed in the Preview window. This effect works best with a short duration; make it longer and it'll have less impact and call attention to itself. Drag the Wash In icon between each clip on your timeline. When you press play, the flashes may look a bit jarring. That's what we're going for here, so don't be afraid.

A white flash adds shock value; keep it short for the most impact.

2 Create Variation If you use a slew of clips, the repetition can get monotonous. No problem—break it up by adding variation. We added slow motion at the end of our movie (where our actor spins around screaming) by clicking its clip and moving the Faster-Slower slider to the right. We also split an overhead shot of our actor in two, and applied slow motion to the second segment. To do this, we positioned the playhead at the point where our actor turns her head and selected Split Video Clip At Playhead from the Edit menu. We selected the second half of the split clip in the timeline and slowed it down using the Faster-Slower slider.

Split the clip in two to add effects to a selected portion of a scene instead of the full clip.

# Create Dramatic Fades

WHAT YOU NEED
EASY
• iMovie 2
• *MacAddict* Transitions Examples (on the Disc)

The popular fade-from-black, fade-to-black transition is a Hollywood classic. Traditionally, it's used to begin a scene (fade in) and then end a scene (fade out). In short clips, a fade-in, fade-out technique between cuts can be quite dramatic, creating a different feel than if you were to use straight cuts (going from one shot to another without a transition). This type of transition works well for a nonaction scene such as a video collage.

For our example movie file, StreetQuickFades.mov, we took three shots (far, close, and side) of an actor walking down a San Francisco street. We used a quick fade-in, fade-out technique between each cut to add more drama (watch StreetCuts.mov to see the movie without any transitions). Here's how to create the effect (use your own clips or iMovie's samples, and follow along).

You don't have to restrict fade-ins and fade-outs to a movie's beginning and end. Use them between cuts for added drama.

1 Set the Fade In
Launch iMovie and drag any three movies from the Clips window to the timeline below in the order you want them to appear. Click Transitions to access iMovie's transitions, and select Fade In. Drag the Speed slider until you see 00:20 appear in the Preview window's lower-right corner. This sets a fade-in time just shy of 1 second. Then drag the Fade In icon (the green box with the right-facing triangle) from the Transitions panel to the beginning of the first clip in the timeline.
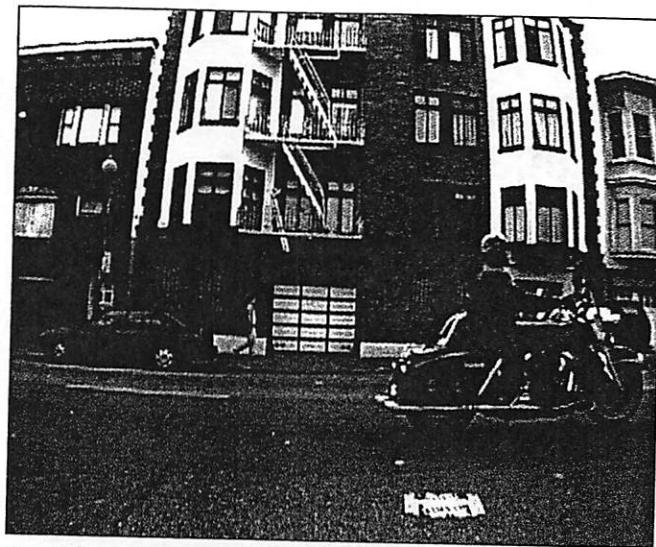

Move the Speed slider until you see 00:20 in the black preview window to set an effect time of just under a second.
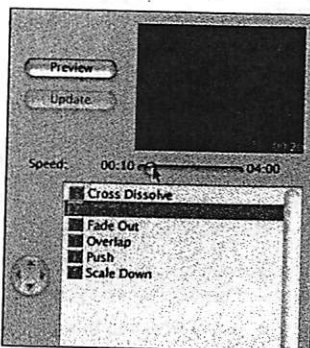
2 Set the Fade Out
From the Transitions list, click and drag the Fade Out icon (any transition you now apply will have the same duration unless you change it) and place it between the first and second clips in the timeline. The first clip now fades in and fades out. Do the same with the other clips in the timeline, dragging Fade In before each clip and Fade Out after (you'll have two transition effects between clips and single transitions at the beginning and end of the movie).
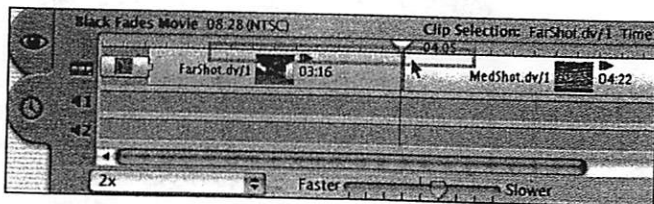
iMovie highlights a targeted cut when you're dragging a transition between clips so you can pinpoint its placement.

Alternatives

LONG FADES To play up the transitions, give the black more screen time. Click the second Fade In transition in the timeline (look for a green block with a right-pointing triangle, between the first and second clips), and move this block about .5 second to the right in the timeline (a dark gray block appears between the Fade Out and Fade In icons). This creates .5 second of nothing, or black. Do the same with the Fade In transition between the second and third clips. The result will look something like StreetLongFade.mov.

Moving a Fade In transition away from its neighboring Fade Out creates extra black screen time.
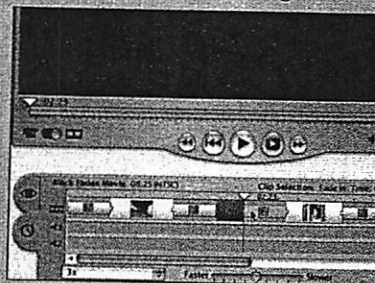
SLOW MOTION Depending on the content of your clips, slow motion might play up the drama very effectively (see our StreetLongSlow.mov example). To create slow motion, select any clip in the timeline and drag the Faster-Slower slider (below the timeline) to the right. Use slow motion sparingly—it can get old really quick.

Slow motion can boost a scene's cool quotient. Just highlight a clip and drag the slider toward Slower.

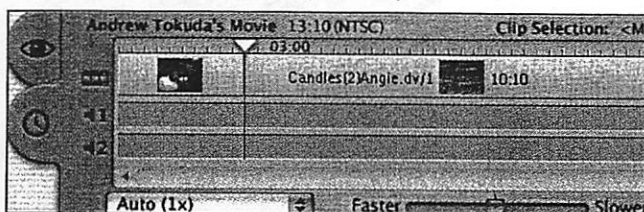# Make a Person Magically Appear

(TRICKY) **WHAT YOU NEED**
- DV camera
- Tripod
- iMovie 2
- iMovie Plug-in Pack 2.1.1 (requires Mac OS X; free download at www.apple.com/imovie)
- *MacAddict* Transitions Examples (on the Disc)

While iMovie transitions generally provide segues between clips, you can also use them to create special effects. With a little bit of creative camera work and iMovie, you can make a person appear out of thin air! Check out MagicDissolve.mov.

For this effect, you need to shoot two segments of video from exactly the same location. You absolutely, positively must use a tripod to lock down the position of the camera, or this effect won't work. Shoot footage of a motionless scene without your subject for about 10

David Copperfield isn't the only one who can make objects appear out of thin air—with a DV camera and iMovie, you can, too!

seconds, and then pause the camera. Then shoot another 10 seconds or so with your subject in the scene (don't let him or her pick up objects until at least 5 seconds into the segment). Import both shots into iMovie as a single clip. Now let's create the effect.

1 Split the Clip
Drag the clip from the Clips window into the timeline and move the playhead to the exact point where the subject suddenly pops into the picture. Use the left and right arrow keys to nudge the playhead backward and forward, fine-tuning its location. Then select Split Video Clip At Playhead from the Edit menu to split the clip into two.
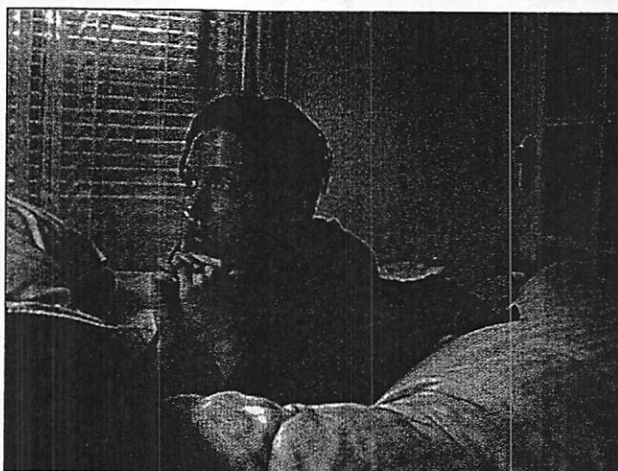

Move the playhead to the exact point where your subject appears in your scene.

2 Add a Dissolve
What you want to do is make the subject slowly fade into the picture; the Cross Dissolve transition will work. Select Cross Dissolve in the Transitions panel and drag the Speed slider to 03:00 (3 seconds). This gives you a nice, slow dissolve. Drag the Cross Dissolve icon from the Transitions panel between the two clips, and voilà! One magical effect.
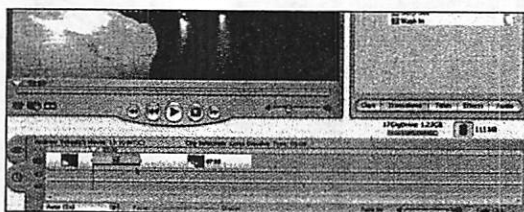
We hate people who pop in without warning; we made our actor's hands emerge gracefully by inserting a dissolve.

3 Pan and Zoom
If you're the adventurous type, a locked camera shot may not be your call of the wild. It certainly wasn't ours. We decided to add some motion to our "magic dissolve" shot by panning (rotating) and zooming the camera during shooting. A word of warning: This is tough! It takes a steady hand, a fluid tripod head, and a bit of luck to pull this off without exposing your shaky maneuvers in the end.

Check out our clips, CandlesNoHands.mov and CandlesWithHands .mov. These shots start at just about the same zoom point. If the shots don't match, you can tediously trim the beginning of one of your two clips little by little until they're perfectly aligned. In iMovie, this is pretty much trial and error.

We started with the clip where our actor's hands pick up the necklace. We wanted the hands to appear at 03:00 in the timeline, so we positioned the playhead at 03:00 and split the clip in two. We discarded the first segment so the clip would start when the hands entered the scene. We then dragged the clip without the hands in front of the clip we'd just edited, and positioned the playhead at 03:00 (the point where we wanted the hands to start appearing). However, because our pending Cross Dissolve spanned 3 seconds, we moved the playhead to 06:00

(6 seconds) to accommodate the extra 3 seconds. (You can do the math, folks.)

From here, we used the Split Video Clip At Playhead command and threw away the portion of the segment after 06:00. Finally, we dragged the Cross Dissolve transition (with Speed set to 03:00) between the two clips—and that's it! (Magic Dissolve.mov features two examples of this motion effect.)

If you're putting a 3-second dissolve at the 3-second mark, you need to trim the clip at 6 seconds.

Andrew Tokuda runs 3rd Light Digital Media, a video and digital-media service, though he's unsatisfied with the title Coffee Guy.

The Digital Video

Digital video production, editing and publishing offer genuine opportunities

By Gary S. Stager

With the possible exception of faster processor speeds, there have been few major developments in personal computing during the past few years. Recent advances in computer and communications technology have had little impact on the nature of teaching and learning. The availability of the Web, handheld computers and wireless communication offer enormous potential, but have thus far allowed us to add speed and convenience to traditional aspects of schooling without transforming the learning experience.

Instructional media has been oversold since the days of Edison as a solution to our educational challenges. However, Dewey, Piaget, Vygotsky and Papert tell us that changing the mode of delivery offers little assistance in transforming learning. Powerful learning occurs when we shift the emphasis from the teacher to the learner ... less us, more them.

The 1970s ushered in the era of low-cost video recorders and portable video cameras. This innovation offered teachers and students with a vehicle for producing their own content. Student productions could be archived, played in other classrooms and sent home to share with the family. Imaginative schools built television studios, offered courses in TV production and some even made cassettes of student performances available in local video stores.

As with desktop publishing and multimedia authoring, Apple Computer is bringing digital video to the masses with ease-of-use and affordable tech-

What's in Gary's DIGITAL MEDIA TOOLBOX

A Sony or Canon digital video camera.
Your choice is between cameras using the smaller newer mini-DV tapes and cameras that use larger 8mm tapes. While 8mm digital cameras are larger than mini-DV models, they do have one advantage. Old analog video tapes you may have are automatically digitized when played by a digital 8mm camera. This saves money and allows you to bring old tapes into the digital age.

iMovie 2 (Mac)
www.apple.com
Apple's groundbreaking, easy-to-use but powerful video capture, editing and publishing software has revolutionized the personal video industry and will revolutionize your classroom, too.

iDVD (Mac)
www.apple.com
Do the impossible and make your own DVDs without ever

REVOLUTION

for students to learn and express their knowledge in new ways

nology. Other companies are now working to offer similar capabilities in their products.

Administrators and school leaders need to understand how this technology is different and what the occupants of classrooms can do with it.

DV in a Nutshell

Digital video cameras, now widely available, store images in the same digital form (bits) as computers store data. This allows video to be transferred from camera to computer and computer to camera without any loss. In other words, every copy is of the same quality as the original. Apple patented FireWire, the high-speed, low-cost digital transfer technology used by nearly all digital video cameras and a growing assort-

ment of hard drives, CD-burners and other peripherals. FireWire is also known as iLink by Sony and IEEE 1394 by other companies. The Academy of Television Arts and Sciences just awarded Apple a 2001 Primetime Emmy Engineering Award for FireWire's material impact on the television industry. Essentially, FireWire is a way to move data between digital devices.

More Power

The real power of digital video is found in the editing process. Just a couple of years ago this required digitizing analog video before your computer could work on it. This process involved converting the analog information on a VHS tape into the bits used by the computer. This transfer process caused a loss in quality. If

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opening a manual. These DVDs may contain video and collections of digital images.

www.media100.com

Cleaner 5 (Mac or Windows)
www.media100.com
Cleaner 5 (previously known as MediaCleaner) is the gold standard for compressing video and converting media files. It often compresses a video by 90 percent with little noticeable degradation. Answer the "wizard's" questions about your priorities and the type of format you wish for your product and let Cleaner 5 do the work for you. It contains converters and codecs (compression algorithms) for transforming media files into different formats. Because the cleaner allows you to batch process files (create a stack of projects for it to

compress or convert at once) means that you can leave your computer on overnight and have it compress lots of files without your supervision.

Slick 1 & Slick 2 (Mac)
www.geethree.com
For just $29.95 you can buy sets of more than 40 really cool new transitions and special effects that plug into iMovie 2.

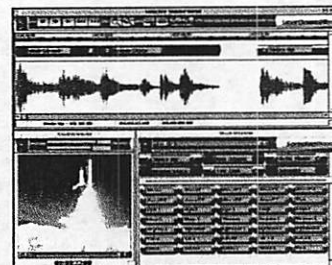**Smartsound for Multimedia (Mac or Windows)**
www.sonicdesktop.com
Smartsound for Multimedia is an amazing software package that allows you to choose a style of music, its use (zippy opener, calm background music, dramatic finale) and the duration you need. The software then magically composes a royalty-free sound file you may

use in your digital productions. Other professional quality music libraries are available.

Sonicfire Pro (Mac or Windows)
www.sonicdesktop.com
SonicFire Pro picks up where Smartsound for Multimedia leaves off by allowing you to automatically score a digital video. Open a QuickTime movie, set markers for different parts of that movie and SonicFire Pro automatically composes a score for that film. The right music fits precisely into the sections of video.

QuickTime Pro (Mac or Windows)
www.apple.com/quicktime/
QuickTime is the industry standard for digital media. The QuickTime

you wanted your edited production to be distributed via TV or VHS, then there would additional loss in quality during the second transfer. Special add-on cards or other peripherals usually needed to be purchased to make digitizing possible.

Once the video is stored on your hard drive you may edit it. Editing brings value to those boxes full of tapes you have and reduces the likelihood that every student production looks like a never-ending bloopers real. Editing may be used to shorten and clean up video. It may also be used as a way to enhance storytelling through reordering events, or by adding narration, dramatic music, transitions and special effects. Every FireWire Macintosh comes with iMovie 2 for free. iMovie allows computer users to capture video from a camera and edit productions with the ease of a word processor. When your movie is complete, output it back to tape or compress it for distribution via CD, the Web or DVD (see sidebar for PC alternatives).

Digital video requires a great deal of disk space. A little more than nine minutes of video requires 2 gigabytes of disk space. Large external FireWire drives are an

Powerful learning occurs when we shift the emphasis from the teacher to the learner ... less us, more them

excellent way for schools to store large video files. These drives also offer teachers portability. They can be moved to where they are needed. FireWire drives may also be chained together to create large banks of data storage.

You can never be too rich or have too much hard disk space

I would suggest that finished productions should be exported to DV tape and archived in that small low-cost way. Preserving video on hard drives makes that video vulnerable to a variety of threats (crashes, erasing, etc.) and is too costly. You can always import video from an archived tape and re-edit it for a different purpose or audience.

When your video masterpiece is complete it is time

Player is free for both Windows and the Macintosh, but paying $29 turns your software into QuickTime Pro. The Pro version allows you to perform quick edits of your digital media (video, audio, animation, VR, graphics) and convert a wide variety of media types.

Dazzle Hollywood DV Bridge (Mac and Windows)
www.dazzle.com
This reasonably priced peripheral, the top-of-the-line product from Dazzle—a company offering a variety of media digitizing products, allows you to convert analog video from a VCR, TV or other video source into digital video via FireWire.

It has inputs and outputs for FireWire, RCA audio, Composite RCA video and S-Video. iMovie 2 instantly recognizes the Dazzle Hollywood DV Bridge as if it were a digital camera. Now your digital movie may be exported directly to a VCR.

VegasVideo 2 (Windows)
www.sonicfoundry.com
VegasVideo 2 is a higher-end video editing software package for Windows. It is geared toward more professional users.

iMic (Mac)
www.griffintechnology.com
iMic is a USB device that allows you to connect a variety of microphones

and audio sources to your computer without built-in sound input.

iVoice Macally (Mac)
www.macally.com
iVoice is a USB microphone with a line-in jack for computers without built-in audio.

VideoFactory 2 (Windows)
www.sonicfoundry.com
VideoFactory2 is a robust, user-friendly video editing and capture package for Windows.

Final Cut Pro (Mac)
www.apple.com
This is Apple's high-end video editing package. It allows the user to make amazing videos with professional quality effects. As a result, Final Cut Pro requires a greater commitment on the part of new users. Taking a course or buying a third-party guide might be a good idea,

to share it with an audience. iMovie 2 and other programs allows you to prepare the video for a variety of media (CD, Web, DVD) through compression. Compression is a mathematical process by which the file size is reduced in order to save space and deliver the video quicker via limited bandwidth. You will need to make decisions about tradeoffs between size and quality. Smaller file size means lower quality video, but it is hard to discern much difference from a compressed file, and the quality of a compressed file is certainly acceptable for classroom purposes.

If you wanted to share last year's school play with out-of-town grandparents, schools had two digital options; low-quality video on CD-ROM or stream the video on the Web. Streaming media is cool, but often requires high bandwidth, expensive servers with large storage capacity and the employment of a technical staff capable of running those servers. Today, $2,500 Macintosh G4 computers include the SuperDrive and iDVD software. The SuperDrive allows the playing of CDs and DVDs, plus the creation of CDs and DVDs. That's right, you can now make your own DVDs. The free iDVD software is even easier to use than iMovie 2. Drag your video files onto the iDVD screen, choose a visual style for your menu and press "burn." A couple of hours later you have a full-quality hour-long

DVD that Grandma can pop into her DVD player (subsequent copies are made much quicker). This technology represents a leap-frog effect on the streaming technology many of us were betting on just a year ago. Imagine a day in the not too distant future in which every kid not only has a TV studio in their laptop, but can produce DVDs, too (competitor products for the PC are becoming available).

Educational Applications

Digital video offers numerous opportunities for student expression through all kinds of storytelling across the curriculum. Personal stories, skits, plays and recreations of historical or scientific events are all possible. Fictional stories may be depicted and mathematical models may be explained. The editing process allows for enhancing the storytelling.
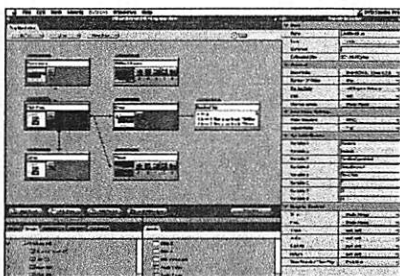
Video offers unprecedented opportunities for students who need to express themselves and their ideas. The obstacles associated with writing and oral presentation make it too difficult for many students to convey their creativity and knowledge. Video and the ability to edit that video lowers the bar on communication. This communication now has a limitless audience available via the Web, CD, tape and DVD.

Kids engaged in the production of school news pro-

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although there are probably high school kids in your district who can figure it all out and teach you.

DVD Studio Pro (Mac)
www.apple.com
This is Apple's professional-level program for creating DVDs with all of the bells and whistles found on commercial DVDs (chapters, motion menus, subtitles, multiple languages, visual angles, etc...) While DVD Studio Pro has a steeper learning curve than iDVD, it is within reach of committed educators.

RealPlayer Basic (Windows or Mac)
www.real.com
RealPlayer Basic is the free version of the client (player) for watching

streaming RealVideo and listening to RealAudio. It often works with your Web browser.

RealProducer Basic (Windows or Mac)
www.real.com
RealProducer Basic is the free tool that allows you to convert your audio or video files into Realmedia files you can stream from any Web site. You will need to hunt around the Real site to find the free versions of this tool. The nice folks at Real Networks naturally want you to trade-up, but for most school uses, the free player and producer software will do the job quite nicely.

Blue Armadillo (Mac or Windows)
www.tech4learning.com/snacks/barmadillo.html
This free tool allows you to batch process a folder full of images. In other words you can use Blue

Armadillo to change the size of a bunch of photos or convert image formats.
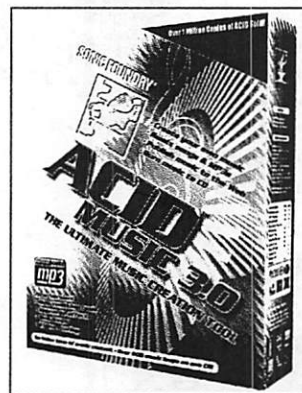
Acid Music 3 (Windows)
www.sonicfoundry.com
This popular PC program and its library of sound files allows the user to compose royalty-free music clips which may then be exported to include in video projects.

A more extensive collection of free and low-cost cross-platform digital media resources may be found at www.stager.org/imovie/
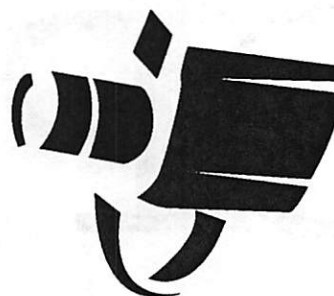
grams, interviews and even commercials gain first-hand knowledge of the ways in which media may be used to manipulate us. Media literacy concepts of bias, point-of-view, propaganda and advertising take on new meaning when kids are behind the camera and the editing process.

You may engage the community in the life of the school through the repurposing and publishing of school events. Tapes of classroom productions may be broadcast on local cable, sent home on CD/DVD or even made available in local video shops for free loans. These efforts keep citizens abreast of the activities in your school and may increase community support for your efforts.

Students may use video cameras and digital editing to document their learning process in a variety of ways. Video is used to tell the story of how they learned, what they did, as well as the finished product. This enhances metacognition, exhibits student knowledge and communicates the learning activities of a school with the community. A good example of a video documenting student learning may be found at www.pencilsdown.org/lego.

Educators may also enhance their professional practice through digital video. Lessons may be videotaped and used to share best practices with colleagues. Similar video may also be used as a vehicle for collaborative action research. Educators can view carefully edited video case studies as an invitation to dialogue about teaching practices and learn new classroom strategies. Raw video may be used with innovative tools like those offered by LessonLab, www.lessonlab.com, as a forum for educators to discuss their own practice and that of colleagues. Examples of adults using digital video as a vehicle for reflective practice may be found at www.stager.org/imovie/virtcamp.html. **D**

Media literacy concepts of bias, propaganda and advertising take on new meaning when kids are behind the camera

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OPUS ONE

BY GARY STAGER

Critics of computers in education often argue the investment in technology detracts from the arts. This does not need to be the case. Increasingly powerful and easy-to-use music hardware and software can rejuvenate any school music program

D id you ever wonder how Stevie Wonder can play just one keyboard and yet produce an orchestra of sounds? The easy answer is because of the Musical Instrument Digital Interface. The MIDI is essentially a networking protocol that allows musical instruments, synthesizers, recorders and computers to communicate. In the case of Stevie Wonder, the one keyboard he plays triggers a variety of synthesizers and generates a remarkable collection of sounds.

Now, why should K-12 schools care about any of this? Because the same tools that allow Stevie Wonder to impress his audience also can make music composition, expression and performance a part of the educational process. These tools provide the scaffolding required to allow even young children to realize the most sophisticated of musical ideas. For less than $500 any classroom can be equipped with a composition/performance/recording studio consisting of a musical keyboard and powerful music software. This technology offers an opportunity to reinvigorate arts education and help schools come alive with the sound of music.

Unlike many high-tech standards, MIDI has withstood the test of time. Since 1983 synthesizers, controllers and computers have spoken the

Kid Composers

Kids love music, but until now you needed the prodigious talent of Mozart to compose music. A variety of software packages now provide children tools with which they can express their original musical ideas. There are several distinct categories of music software, but many packages contain features from other categories. For example, sequencing software may include features found in digital recording software allowing you to add reverb or other effects to your music.

SEQUENCING SOFTWARE
Sequencers are hardware devices that store and playback music. Sequencing software allows the player of a MIDI controller (typically a keyboard) to not only remember the notes played, but also to edit those notes. Most sequencing software even lets you, enter notes one at a time, regardless of tempo, and overcome a lack of piano technique by fixing your flubs later. Unlike playing the piano, you do not need to play more than one note at a time. You can layer parts like tracks in a video. Most sequencing software uses some sort of non-musical graphical representation of the music for the purposes of editing. (All of the software mentioned is available for Mac or PC except where noted)

Mark of the Unicorn's *(www.motu.com)* **Performer and GVOX's**
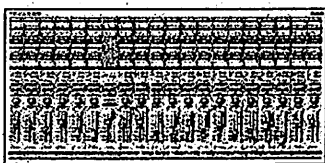
(www.gvox.com) **Master Tracks Pro** are excellent examples of "super-sized" sequencing software.

NOTATION SOFTWARE
Notation software provides the musician with a way to create written scores and sheet music. The notes, rests and accidentals are entered with a mouse or keyboard. The software offers many advantages over writing by hand, including the ability to instantly turn scores into transposed parts, excellent print output and the ability to cut and paste.
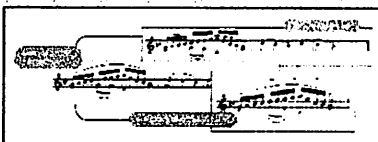
Finale Notepad, *(www.finalenotepad. com)*, by Coda Music, is an easy-to-use notation package that allows you to choose different instruments, create up to eight staves, enter lyrics, and publish music created on your computer on the Web. Did I mention that it is also free for both the Mac and PC?

Fifth grade students at the Village School in Los Angeles use Finale Notepad to compose their own musical pieces by developing a melody and harmony for three or more instruments (See illustration). By limiting themselves to the pentatonic scale, pesky dissonances are easily avoided. The music is composed on the computer where it may be heard, modified and printed. After just two months kids are adding second and third themes to their compositions. Each completed opus will be about two minutes long. The school's technology director, Tara Higgins, will then open the Notepad files in one of Coda's more powerful packages, like PrintMusic! or Finale

language of MIDI.

MIDI is a bi-directional pipeline allowing connected devices to share data. That data is a series of numbers describing a musical note—its pitch, volume, length (sustain) and instrument. Anytime you turn an event or data into a code remembered by a computing device you are digitizing that information. Striking the key on a MIDI keyboard turns that middle-C into a set of bits capable of being manipulated. It is the potential for the manipulation of musical gestures that makes this technology so powerful in an educational setting.

Most people are familiar with the popular electronic keyboards that allow the player to change instrument sounds or play-along with accompaniment. Some of these keyboards are MIDI controllers as well. That means that it can be played like a piano and be used to control infinite sounds, multiple instruments or even record a performance digitally. These devices are connected to each other via MIDI cables and to computers via a MIDI interface.

The cost of a MIDI interface starts at about $50 and goes up depending on how many devices you wish to control. Older MIDI interfaces required a serial port, but most new ones use USB. MIDI hardware and software is available for Macs and

Allegro and export MIDI files. Those MIDI files can easily be converted to .WAV files via QuickTime Player Pro (quicktime.apple.com) and burned to a "Greatest Hits of Fifth Grade CD." This explosion of musical expression impresses kids and parents alike.

HYBRID SEQUENCING/NOTATION SOFTWARE
The best bet for schools may be software packages combining the features of sequencing and notation software. Budding composers may play their composition, edit, print and perform their compositions in one package. Many of these packages allow note entry via computer keyboard, mouse or musical controller.

PrintMusic! *(www.codamusic.com)* is an entry-level sequencing/notation package costing only $69. It allows for 24 staves of music and includes MIDI-Scan technology allowing you to turn sheet music into editable music via a scanner.

Mark of the Unicorn's Freestyle *(www.motu.com)*, **Music Time Deluxe** *(www.gvox.com)*, **Finale Allegro** *(www.codamusic.com)* and **CakeWalk HomeStudio** (PC only) *(www.cakewalk.com)* are powerful, moderately priced sequencing/notation packages for serious music students and their teachers.

Coda Music's Finale 2002 *(www.codamusic.com)* enjoys a 50 percent academic price, and it is the most popular notation/sequencing suite on the market. More advanced arrangers, composers and school band leaders will find the $300 a wise investment. Encore (www.gvox.com) is Finale's worthy competitor.

Mosaic (Mac only) *(www.motu.com)* considers itself state-of-the-art desktop publishing for music. While it includes sequencing features, its strength is in paper output.

Cubasis VST *(www.steinberg.net)* combines sequencing, notation and digital recording studio functionality in one package for Mac or PC.

Most sequencing and notation programs have a proprietary file format. They usually include the ability to export or import a standard MIDI file. This is the way you will move your music between applications.

COMPOSING WITHOUT NOTES
Hip-hop music is often built upon digital samples of other music woven together to create a new aural fabric. **Mixman** *(www.mixman.com)* and **Acid** *(www.sonicfoundry.com/products/)* are programs that allow you to combine samples of pre-recorded songs, known as loops, with MIDI files to compose new royalty-free music. Tracks are visually layered to create compositional sophistication to a funky beat. Both products have large libraries of loops/samples available for use in new compositions. The user/DJ community trades free loops online.

Superduper Music Looper *(www.sonicfoundry.com/products)* lets kids, ages 6-10, compose music with just a mouse, on-

Windows. Like many visual artists, Macs are popular among musicians.

If you are looking to purchase an electronic keyboard, be sure it has a GM logo on it indicating that the device is General MIDI compliant. General MIDI is a refinement of the MIDI standard ensuring that your piccolo always sounds like a piccolo and not a tuba, regardless of the device generating the final sound. You should also remember to invest in headphones for each musician.

Other MIDI devices include drum machines, electronic wind-instruments (imagine playing a trumpet and hearing a violin), synthesizer modules and digital recording decks. Not every synthesizer, the computer producing digital sounds, needs to have a keyboard, drum pad or wind controller attached. Many synthesizers are housed in small boxes often mounted in racks off-stage and out of view.

Most computer operating systems possess the ability to play MIDI files. QuickTime uses General MIDI as its standard and will play most MIDI files. The great thing about MIDI files is that they are so compact you can easily add complex music to a multimedia project or Web page without using too much disk space or bandwidth. For example, a commercially produced MIDI arrangement of Stevie Wonder's "My Cherie Amour" requires only 48K of disk space.

Royalty-free and commercial MIDI files are easily found on the Web. Depending on the license granted by the copyright owner, you may use these files in your own projects.

The microcomputer is MIDI's best friend. It may be used to compose and playback music; edit and master recorded music and store musical ideas for future manipulation. The processing power and storage capabilities of the personal computer are essential for the production of digital music. The music synthesizing abilities of most personal computers are primitive when compared with dedicated musical synthesizers. It is for that reason that you should connect a hardware synthesizer to the computer and play the music through the device when performance is the goal. **D**

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screen paintbrush, an erase tool and their imaginations. A huge library of professionally recorded loops lets kids experiment with instrument sounds and compose their own music.
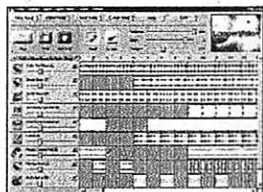
ACCOMPANIMENT SOFTWARE
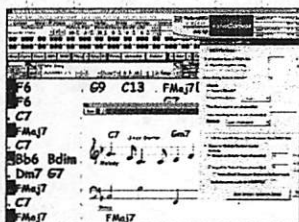
Band-in-a-Box is a perennial favorite among performers of popular music. Its publisher *(www.pgmusic.com)* calls Band-in-a-Box "intelligent music accompaniment." Type a chord progression into the software, choose a style of music from a huge selection and Band-in-a-Box will produce a professional-quality accompaniment of piano, bass, guitar, drums and string section. It will even generate improvised solos and import/export MIDI files. This software could come in quite handy for school musicals. PGMusic sells libraries of songs and sounds for Band-in-a-Box. Despite its novel (funky) interface, Band-in-a-Box is loved by its users.

MAGIC SOFTWARE

There are a few pieces of music software that take your breath away. **SmartMusic Studio** *(www.codamusic.com)* and **SmartScore** *(www.musitek.com)* are clear examples of software alchemy. I have not personally reviewed **Autoscore Pro,** *(www.wildcat.com)* but it holds a great deal of promise.

Autoscore Pro (PC only) from Wildcat Canyon Software (www.wildcat.com) promises musicians the ability to sing or play a non-MIDI instrument and have the software automatically convert that music to editable written music. It will even cope with your occasional intonation problems by restricting input to a particular key.

SmartMusic Studio for Vocalists, SmartMusic Studio for Woodwinds and Brass and **SmartMusic Studio for Vocalists, Woodwinds and Brass** are designed to make music practice more efficient and pleasant. The player uses a microphone to input her performance into the computer and then the computer accompanies the musician. It not only accompanies, it follows you with spontaneous tempo changes! SmartMusic Studio brings emotion to the too often-isolated mechanics of practicing an instrument.

Music teachers will be impressed by the 20,000 exercises and 5,000 musical pieces in its library available for an annual subscription of between $20 and $90 per year. The online library even features audition pieces organized by state. *(www.smartmusic.com)*

Musicians interested in rearranging a piece of sheet music with the drudgery of hand-copying will love SmartScore. The moderately priced software scans sheet music and turns it into fully editable notes on the screen. It may then be performed by the computer or attached MIDI synthesizer, rearranged, exported as a new MIDI file or printed. Three versions exist for full scores, lyrics with piano and either piano or solo instrument.

Apple

Thanks again for taking the time to register your new version of iPhoto.

Our Gift to You
In return for the time you spent registering iPhoto, we've enclosed a list of some undocumented keyboard shortcuts which will help you get the most out of iPhoto.

Action	Keyboard Shortcut
Organize	
Reverses direction of Rotate	Option
Adds an individual photos to selection	Command-Click
Extends range of selection along left-right/top-bottom lines	Shift-Click
On a photo, reverses Preference between Separate Window and Edit View	Option-DoubleClick
On an album, switches between Book/Organize views when switching into that Album	Option-Click
Removes a photo from the current album or the Photo library	Delete
Edit	
On a photo in Edit View will return to the Organize menu	Option-DoubleClick
Hold down during Constrained drag will temporarily disable the constraint	Command
Hold down during Contrained drag will flip between portrait/landscape for current aspect ratio	Option
Go to the next and previous photos, respectively	RightArrow and LeftArrow
In Edit view will delete an image from the current album or Library	Delete
Book	
Holding down while choosing a page design applies that design through end of book	Option
Book Preview	
Back one page	Arrow Left or Page Up
Forward one page	Arrow Right or Page Down
Slide Show	
Pauses/resumes slide show	Space Bar
Makes the slide show go faster in 1 second increments	Arrow Up
Makes the slide show go slower	Arrow Down
Pauses the slide show and goes back one slide	Arrow Left
Pauses the slide show and goes forward one slide	Arrow Right
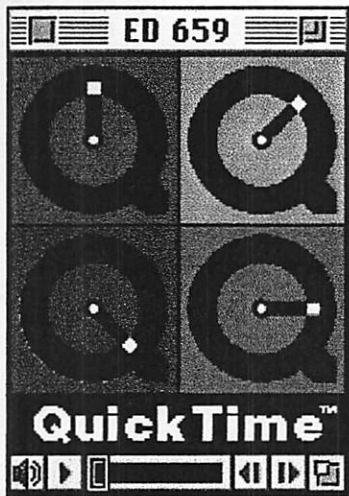
# Simple QuickTime Editing with the MoviePlayer and QuickTime 2.0

Gary S. Stager
Pepperdine University
Graduate School of Education and Psychology

Basic principles apply to QuickTime Pro Player 5 as well!

QuickTime is the software standard for playing and editing video on Macintosh computers. (It is also available for Windows) Many applications, such as ClarisWorks, MicroWorlds, HyperStudio, SimplePlayer and HyperCard can play QuickTime movies in their documents. The MoviePlayer system software allows users to play and perform simple editing functions on QuickTime movies on the desktop. More powerful and complicated software, such as Adobe Premiere and Avid Videoshop are required for more complex editing tasks.

When a QuickTime movie file is opened from the desktop, the Macintosh searches for the MoviePlayer program and opens it as well. MoviePlayer can have multiple movies open simultaneously - allowing for editing between movies.

QuickTime movies can include video, audio, text and MIDI tracks or one or more of these track types.
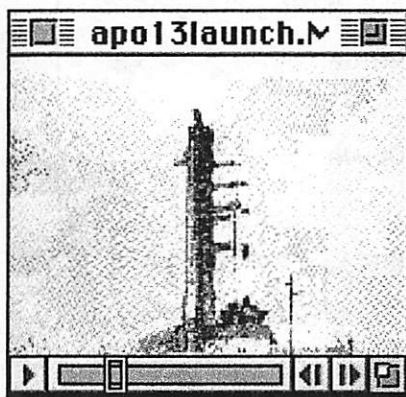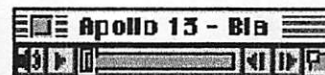
Movie without Audio Track

Movie with Audio Track

Movie with Audio Only

🔊 Volume Controller

▶ Play/Pause Button

◀| |▶ Step Buttons

🗗 Size Box

Slider

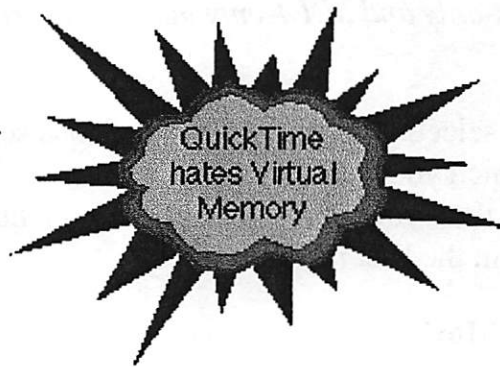Play Bar

Ways to Play a Movie

• Double-click on the movie window
or
• Click the Play button on the movie controller
or
• Press the Return key or spacebar

Ways to Pause a Movie

• Click once on the movie window
or
• Click the Pause button (switches with Play button) on the movie controller
or
• Press the Return key, spacebar or ⌘.

QuickTime hates Virtual Memory

To Play Every Frame in a Movie

Sometimes a movie contains more frames than can actually be perceived in a finite amount of time. To see all of the frames do the following.

• Hold down the Option key while clicking the Play button

To Move Forward or Backward through a Movie

• Drag the slider left or right
or
• Click on the step left or right buttons

To Move One Frame at a Time

• Use the right or left arrow keys
or
• Shift-click on the Step buttons

Explore what other menu items do!

To Jump to the Beginning or End of a Movie

• Option-click on a Step button

To Select a Portion of a Movie

You need to select a section of the movie in order to cut, paste or add frames.

• Hold the shift key down while dragging the slider in one direction
or
• Hold the shift key down while clicking on the left or right arrow keys
Copy or cut the selection using the Edit menu or its keyboard equivalent

Pasting Frames in a Movie

You may paste a collection of frames in the same movie or a different one. If one of the movies is physically larger, the "new" movie will expand to the size of the larger one.

Pasting frames adds length to the movie at the point in which the frames are pasted. These instructions

apply to text-only, sound-only and MIDI-only movies too. You may also paste individual PICT images into a movie.

1) Select and copy/cut a selection of frames (see previous section)
2) Open the movie to which you wish to add the frames
3) Drag the slider or use the arrow keys to select the beginning position for the new frames
4) Choose Paste (V) from the Edit menu

Replacing Frames in a Movie

You may replace a collection of frames in the same movie or a different one. If one of the movies is physically larger, the "new" movie will expand to the size of the larger one.

Replacing frames may lengthen or shorten a movie depending on the length of the new selection replacing the old selection. These instructions apply to text-only, sound-only and MIDI-only movies too.

1) Select and copy/cut a selection of frames (see previous section)
2) Open the movie to which you wish to replace the frames
3) Drag the slider or use the arrow keys to select the beginning position for the new frames **or** select a number of frames with the shift key and arrows or slider
4) Hold down the shift key and choose Paste from the Edit menu

Adding Frames in a Movie

Adding frames means that you will superimpose a new movie track (sound, text, video, or MIDI) to an existing movie. This new track will play along with existing tracks for the duration of the added tracks. Sound will be mixed primitively and the latest video track will be visible. To do more complex editing with transitions and audio mixing, you will need to use a more powerful QuickTime editing package.

If one of the movies is physically larger, the "new" movie will expand to the size of the larger one. These instructions apply to text-only, sound-only and MIDI-only movies too.

1) Select and copy/cut a selection of frames (see previous section)
2) Open the movie to which you wish to add the frames
3) Drag the slider or use the arrow keys to select the beginning position for where you wish to begin the new track
4) Hold down the Option key and choose Paste from the Edit menu

Adding Scaled Frames in a Movie

*Adding scaled frames mean that you will superimpose a new movie track (sound, text, video, or MIDI) to an existing movie. This new track will play along with existing tracks, **but will be "scaled" to fit in a particular selection of another movie. If the selection is too short, the new frames will be accelerated -** too long and the new frames will play in slow motion. Sound will be mixed primitively and the latest video track will be visible. To do more complex editing with transitions and audio mixing, you will need*

to use a more powerful QuickTime editing package.

If one of the movies is physically larger, the "new" movie will expand to the size of the larger one. These instructions apply to text-only, sound-only and MIDI-only movies too.

1) Select and copy/cut a selection of frames (see previous section)
2) Open the movie to which you wish to add the frames
3) Hold the shift key down and drag the slider or use the arrow keys (with Shift) to select the the location of the new frames
4) Hold down the Option-Shift keys and choose Paste from the Edit menu

Enabling/Disabling Tracks from a Movie

Choose Enable Tracks... from the Edit menu
Toggle the tracks you wish to enable/disable by clicking on the ON/OFF icons
Click OK

Deleting Tracks

Deleting Tracks allows you to remove.

Choose Delete Tracks... from the Edit menu
Select the track you wish to delete - Use Command and click to select multiple tracks
Click OK

Extracting Tracks

Extracting a track allows you to grab an entire track from one movie and create a new movie containing only that track. This allows you to copy an entire track for use somewhere else or edit the track.

- Choose Extract Tracks... from the Edit menu
- Select the track you wish to extract - Use Command and click to select multiple tracks
- Click OK

The original movie will not be altered.

Changes will not be kept until you save the movie!

To Add, Replace, Paste or Add Scaled Text to a Movie

MoviePlayer does not give you the flexibility for titling a movie that is available in other packages, but does allow for sub-titles and text searches.

Copy a passage of text from another application, such as a word processor
Add, paste or replace the text in the same way you would with a video clip

Searching for a Word in the Text Track

Choose Fine (F) from the Edit menu
Type the word you wish to find and OK

Creating a Preview (Poster) for a Movie File

A preview or poster frame is a still frame from a movie file that appears when as a desktop icon and in the file Open dialog box.

Advance the film to the desired frame. Be sure that the movie is paused.
Choose Set Poster Frame from the Movie menu
Save the movie

Creating a Dynamic Preview for a Movie

You can also make a selection of the movie a preview for that movie.

Choose Get Info from the Movie menu
Choose Preview from the right Movie Info menu
Select Set Preview to Selection
Close the Movie Info dialog box
Save your movie

Note: If you have system software with "Drag and Drop" you can simply drag and drop a selection of frames onto the Movie Info dialog box when setting the preview frames. The dynamic preview may be a carefully edited movie trailer from another movie!

Presenting a Movie as a Slideshow

MoviePlayer lets you play a movie frame-by-frame by clicking on the mouse button. This is especially good for movies comprised of still pictures.

Choose Present Movie (M) from the File Menu
Select Slide Show for the Mode
Click the Play Button

Importing Other Types of Data

You may open or import AIFF sound files, MPEG movie files, Audio CD tracks and MIDI files into QuickTime. Just select the file and click on the Convert button in the file dialog box.

Saving your Movie

MoviePlayer gives you the option of saving your movie as a self-contained file or one with dependencies.

The file with dependencies only saves reminders of where your data came from in other files on your

hard drive. The advantage is that your file size will be very small. However, you can not play this movie on another computer without having all of the files it is dependent on. This is fine on your computer or on a CD-ROM where a clip might be used over and over. It is not advisable if you wish to distribute a movie.

The larger self-contained files contain all of the data required by the movie and are therefore much bigger and safer.
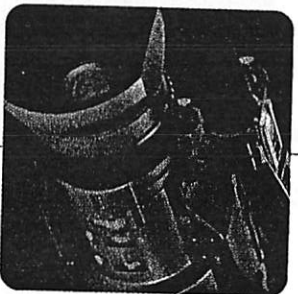
FOCUS ON DIGITAL VIDEO

FROM THE INCREASING NUMBER OF

LOW-COST, HIGH-QUALITY DIGITAL

CAMCORDERS to the growth of Apple's

Final Cut Pro video-editing software,

Mac users have better access to power-

ful digital-video tools than they've ever

had before. This special supplement from

the editors of *Macworld* highlights the

latest generation of video-capture tools

and gives you pointers on using Final Cut

Pro 3 efficiently.

LIGHTS, CAMCORDER, ACTION *p. 60*

DV TO DVD: DVD STUDIO PRO 1.5 *p. 65*

GET BETTER VIDEO IN LESS TIME *p. 66*

LIGHTS, CAMCORDER, ACTION

BY JEFF PITTELKAU

Lower Prices, Added Features Boost Digital Camcorders' Appeal for Mac Moviemakers

For more than two years, Apple has touted the Mac as the ideal tool for creating your own videos. This is more than just marketing hype. With the latest releases of iMovie, iDVD, and Final Cut Pro—and now DVD Studio Pro (see "DV to DVD")—video editing on the Mac has never been easier. And Mac-using video editors have never been more productive, whether they're creating DVDs for clients or producing home movies.

But before you can become a digital-video auteur, there's one essential piece of equipment you need: a DV camcorder. If you've been holding off on diving into digital video because of the prohibitively high cost of cameras, your wait is over.

Every camcorder maker has cut prices across the board this year, ushering digital video into the mainstream. For as little as $600—maybe less if you shop around—you can get a basic MiniDV camcorder with FireWire connectivity. Even with the recent price increases for Apple's new iMac models—which start at $1,399—you can be up and running with a complete DV editing system for less than two grand.

How Low Can They Go?

Among the most notable price cuts in 2002 are revised prices for models previously reviewed in *Macworld* (*Reviews*, December 2001). The new ZR line from Canon (800/652-2666, www .canondv.com)—which includes the ZR40 ($699), ZR45MC ($799), and ZR50MC ($899)—includes cameras that cost $100 less than the models they replace. But these cameras offer more than just price cuts; they also sport several feature enhancements, such as new case designs, more-durable port covers, and a low-light shooting mode.

In contrast, Sony (800/571-7669, www.sony .com) put its DCR-TRV17 on a feature diet. The company reduced the size of that model's LCD monitor from 3.5 inches to 2.5 inches and created the DCR-TRV18, which costs $800—$300 less than its predecessor. Meanwhile, the latest entry-level model from Panasonic (800/211-7262, www.panasonic.com), the PV-DV52, is one of the first DV camcorders to hit the new low-price benchmark of $600.

Another player in the DV-camcorder marketplace is Sharp (800/237-4277, www.sharp-usa .com), which recently introduced three new Digital Viewcam models, the VL-NZ50U ($600), VL-NZ100U ($700), and VL-NZ150U ($800). These models feature Sharp's unique Viewcam design, which incorporates a split, rotating body styled more like a digital camera than a camcorder.

Image Is Everything

Another big change in digital camcorders is the nearly ubiquitous adoption of still-image capture to some kind of memory card. Many midrange models, such as the new GR-DVL725U from JVC ($900; 800/526-5308, www.jvc.com), feature high-resolution CCD chips capable of capturing more detail in still images than is allowed by the MiniDV tape format. High-end models, such as Sony's DCR-TRV50 ($1,600) and Canon's Optura 100MC ($1,899), go as high as 1.5 megapixels and include pop-up flashes, making them every bit as good as a comparable still-image camera. At press time, Sony had announced the 17-ounce DCR-PC101 ($1,300), a 1-megapixel camera and digital camcorder combination that's the smallest of all Sony MiniDV models.

Many of the new hybrid camcorders include USB ports for still-image capture to a PC. While you might think that these ports would work just fine with a Mac, at press time only Sony would go on record claiming that its models were Mac compatible. For incompatible models, you'll need a USB card reader, such as the $23 SecureMate, from SanDisk (800/977-5427, www.sandisk.com).

As if stills weren't enough, many of these hybrid camcorders can capture low-resolution video in the MPEG-4 format and store it on the camcorder's memory card. This feature will be more interesting to Mac users after the release

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of QuickTime 6, which features full MPEG-4 support for creating and viewing streaming video at lower bit rates that require less bandwidth.

For Pros and Prosumers

Two principal features define a professional DV camcorder: CCD chips and stability. For higher-fidelity color and better image quality, three CCD chips—one each for sensing the red, green, and blue components of a video image—are a must. To reduce the shakes that are inevitable when shooting without a tripod, optical image stabilization does a much better job than the digital systems used in consumer camcorders. Models with these high-end features are now more affordable and feature-rich than last year's models.

Panasonic's latest three-chip model, the $2,300 PV-DV952, costs $200 less than its predecessor, the PV-DV951. Still, it includes a number of improvements, such as a pop-up flash, remote control, and zoom microphone. If you shoot scenes that include computer monitors, you'll appreciate Clear Scan, one of the many new features in Canon's upgrade to the XL1, the XL1S ($4,699). This special shooting mode is adjustable to match the refresh rate of computer monitors for flicker-free recording.

And if you're looking for a three-chip camera that can do video streaming, consider JVC's GY-DV300 with its optional KA-DV300 network adapter. The $4,294 combination features a built-in Web server for streaming video that also allows you to control the camcorder from any Web browser. Sony has recently announced the DCR-TRV950 ($2,500), which it bills as the industry's first three-CCD camcorder with one megapixel for each chip.

Look Ma, No Wires

If you're wondering whether Apple's decision to add Bluetooth support to Mac OS X will impact digital video (see "True Blue," *Mac Beat*, elsewhere in this issue), you may be interested to know that Sony has introduced a number of camcorders that support this wireless connection interface. Sony offers three MiniDV models with Bluetooth—the DCR-PC120BT ($2,000), the DCR-TRV950, and the DCR-TRV50. Since Apple's support of Bluetooth is nothing more than a technology preview at this point, it may take some time before your Mac fully supports these models. Still, it's nice to dream.

What to Look For

With nearly 100 different digital camcorder models available at any given time, how do you decide which one is right for you? Here are things to look for when you're shopping for a camcorder.

Compatibility

Generally, most MiniDV and Digital8 camcorders that include an IEEE-1394 port—commonly referred to as a FireWire or i.Link DV—will work with a Mac. However, there may be a few glitches, such as incomplete support for tape control from within iMovie. Apple maintains a database of models it has tested at www.apple.com/imovie/compatibility.html. This list is often out-of-date, but that's not necessarily a bad thing—discontinued models can often be had at deep discounts.

CCDs

Consumer models use a single CCD; professional models use three. Commonly called three-chip camcorders, these models capture the best color, which is critical if you're shooting a music video or the evening news. But if you're just recording a Little League game or a recital, a single-chip model is fine. Just remember that the same rule that applies to digital cameras applies to camcorders: the more pixels, the sharper the images.

Zoom

Optical zoom moves components in the lens assembly to focus on a larger or smaller area, giving you the full resolving capability throughout the zoom range. Digital zoom magnifies a small portion of the recorded image, which results in a pretty much unusable image. For this reason, when comparing camera models, you should focus on optical zoom ratings.

Microphones

Camcorders with built-in microphones on the front generally record better sound than camcorders with microphones on the top. However, microphones in all consumer-grade camcorders aren't that great. You'll record much better sound if you invest in a zoom microphone—standard equipment on professional camcorders—that can vary its sensitivity in tandem with your camcorder's zoom lens. You can pick up a microphone for around $100.

Low-Light Recording

The DV format can record incredible sharpness and color, provided you're recording a scene that's strongly illuminated. For dim-light recording, many models now include amplification circuitry to capture a halfway decent image. But for best results, you can't beat an add-on light, also about $100.
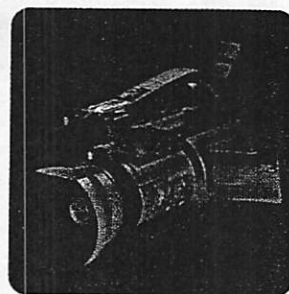
Direct to Video JVC's professional-grade GY-DV300 with a KA-DV300 network adapter ($4,294 for the set) features a built-in Web video server.
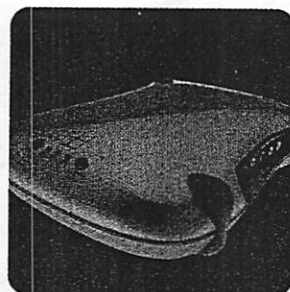
Studio Audience You can use Formac's $399 Studio DV/TV to watch TV—or capture standard video from an analog VCR or a Mac-incompatible camcorder.
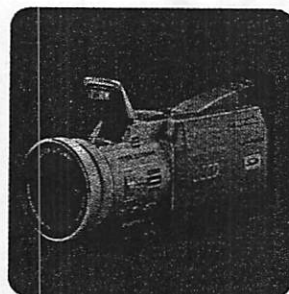
Pro Production Panasonic's $2,300 PV-DV952 features an optical image stabilizer and three CCDs, but it costs $200 less than its predecessor.

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Alternative Formats

Speaking of dreams, two new formats are now appearing in digital-video camcorders. Neither works with a Mac, but they're worth noting if for no other reason than they meet two consumer needs: size and speed.

On the size front, Sony has introduced a new tape format called MicroMV, which records digitally in MPEG-2 format to tiny cassettes. The small size of MicroMV tapes allows for camcorders that really do fit in a shirt pocket. The first two models to be released are the DCR-IP5 ($1,300) and the Bluetooth-enabled DCR-IP7BT ($1,700).

If you just can't wait to edit and view your video, you might want to consider a camcorder that records to DVD-RAM, which offers random-access capability not available to tape-based camcorders. Panasonic and Hitachi are the only players in this game, but both offer products that, unfortunately, aren't compatible with a Mac. Still, the latest models from Hitachi (800/448-2244, www.hitachi.com)—the DZ-MV200A ($900), DZ-MV230A ($1,000), and DZ-MV270A ($1,300)—have relatively low prices and can record directly to DVD-R media, which can be played in home DVD players. If you're desperate to have a camera that supports the MicroMV or DVD-RAM formats, you can connect the analog video outputs to a Mac-compatible FireWire video encoder, such as the $399 Studio DV/TV, from Formac (877/436-7622, www .formac.com).

One alternative format that does work with a Mac is Sony's Digital8, which uses standard 8mm videocassettes to record in the DV format. These camcorders are bulkier than their MiniDV counterparts, but they cost less. Sony's latest entry-level model, the DCR-TRV140, sells for only $500. Digital8's winning advantage is its ability to play back analog tapes recorded by older 8mm camcorders.

What's Next?

Considering that many of this year's low-priced camcorders came about as the result of feature trade-offs, $500 may be about as low as you'll be able to go. What's in store for next year? You can expect to see some of the features found in midrange camcorders—such as high-resolution stills—appear in entry-level models. And keep an eye on the format wars, to see if either DVD-RAM or MicroMV will become noteworthy enough to deserve Apple's attention—and support. □
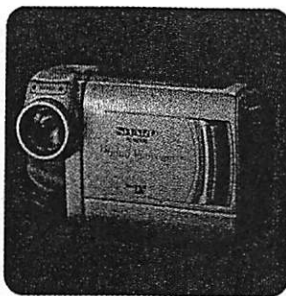
JEFF PITTELKAU, former Macworld Lab director, is a freelance writer covering Mac products and technology.
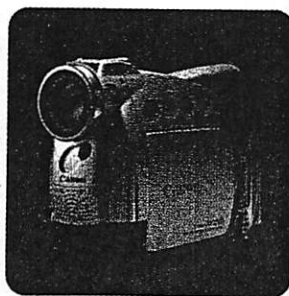
Low Light, Lower Price Canon's ZR45MC is an improvement on the ZR25MC, offering low-light capability and a $100 lower list price.
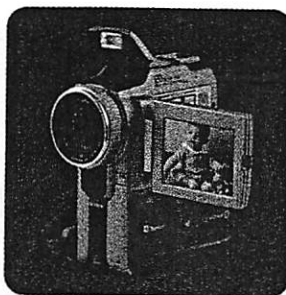
Am I Blue? Only time will tell whether Sony's Bluetooth-enabled DCR-PC120BT plays nicely with Apple's new Bluetooth implementation.

Candid Camcorder With list prices ranging from $600 to $800, Sharp's Digital Viewcam models offer cameralike simplicity.

DV to DVD

DVD Studio Pro 1.5 Provides OS X Support and Improved Integration with Final Cut Pro

While DV-camcorder manufacturers cut prices and add features to movie-making hardware, Apple (800/692-7753, www.apple.com) is busy updating the software you'll need to create eye-catching videos and DVDs. In the past year, Apple has released updates to iMovie, iDVD, and Final Cut Pro, adding OS X compatibility and other enhancements. The latest video tool to undergo a revision is Apple's DVD-authoring program, DVD Studio Pro.

Unlike the entry-level iDVD, DVD Studio Pro is a professional tool for producing full-featured DVDs—you can create DVDs containing more than two hours of high-quality video per disc with as many as 99 separate tracks.

With DVD Studio Pro 1.5, Apple adds support for OS X. That means more than just an Aquafied interface for the DVD-authoring program. Apple says OS X compatibility will add greater stability while letting the Quick-Time MPEG-2 codec included with DVD Studio Pro encode MPEG video and compile products in the background.

In addition to OS X compatibility, the updated DVD Studio Pro features better integration with Final Cut Pro 3, Apple's digital video-editing software. Users can set chapter markers in Final Cut that are automatically carried over to DVD Studio Pro.

DVD Studio Pro 1.5 comes bundled with the Bias Peak DV audio editing software and Corel Photo-Paint. The addition of the graphic editing software addresses a need with the original DVD Studio Pro, which required users to turn to a separate program such as Adobe Photoshop to create interface elements for their DVDs.

The DVD-authoring software sells for $999. Existing users can upgrade for $199.

If you shoot and finish your work with 35mm and 16mm film but want the cost and time benefits of digital editing, Apple offers Cinema Tools for Final Cut Pro. The new program enhances Final Cut's 24 frames-per-second editing capabilities, adding support for film cut lists and 24-frame edit-decision lists for high-definition video. The $999 Cinema Tools, which is slated to ship in May, incorporates some of the technology used in FilmLogic; Apple bought FilmLogic maker Focal Point Systems in 2001.—PHILIP MICHAELS